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Trent et al.

(10) **Patent No.: US 7,816,491 B2**
(45) **Date of Patent: Oct. 19, 2010**

(54) **ORDERED BIOLOGICAL NANOSTRUCTURES FORMED FROM CHAPERONIN POLYPEPTIDES**

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C07K 14/00 (2006.01)
A61K 38/00 (2006.01)

(52) **U.S. Cl.** **530/350**; 514/2; 977/773

(58) **Field of Classification Search** ..... None
See application file for complete search history.

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(57) **ABSTRACT**

The following application relates to nanotemplates, nanostructures, nanoarrays and nanodevices formed from wild-type and mutated chaperonin polypeptides, methods of producing such compositions, methods of using such compositions and particular chaperonin polypeptides that can be utilized in producing such compositions.

17 Claims, 36 Drawing Sheets

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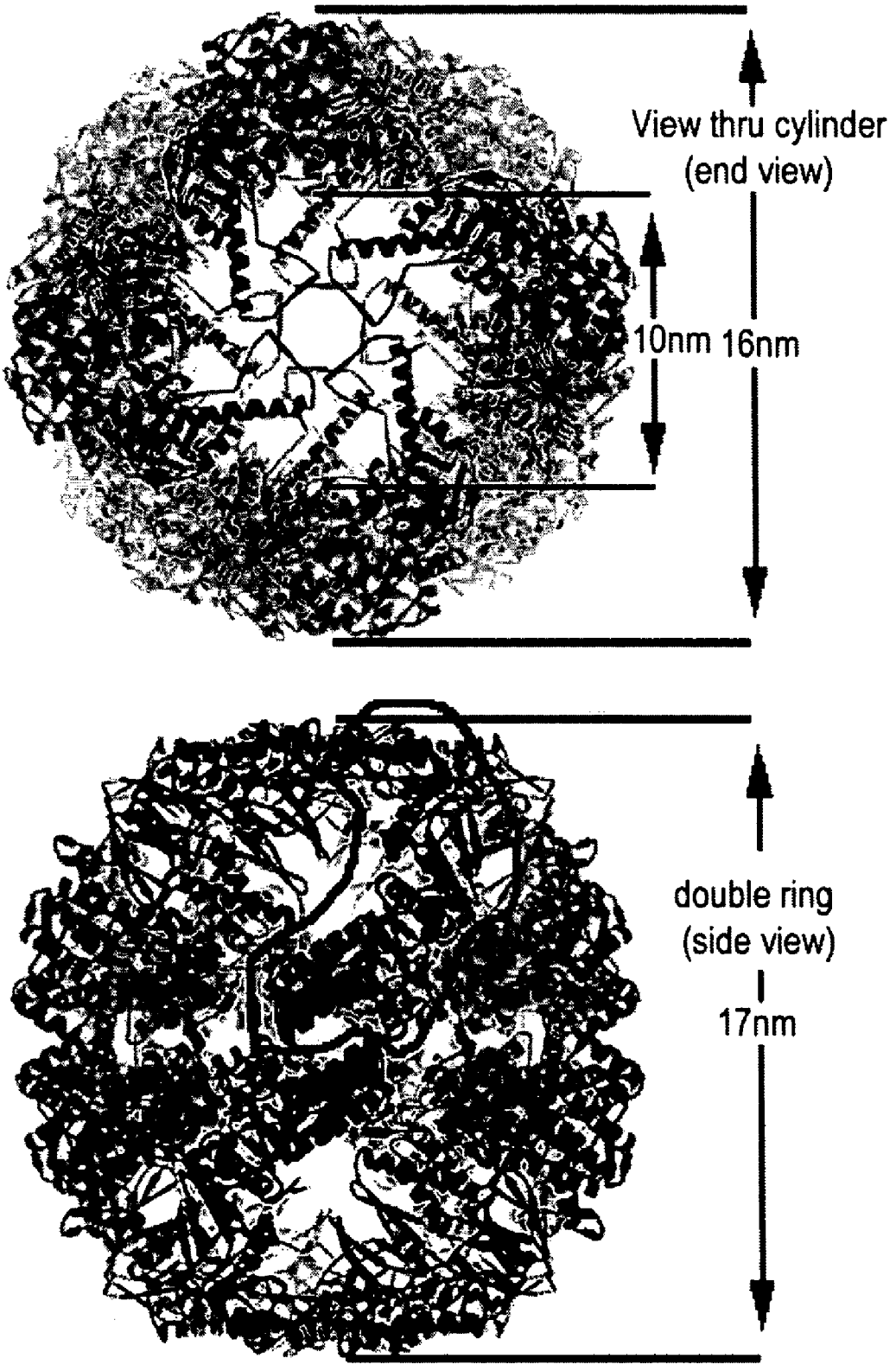


FIG.1 Prior Art

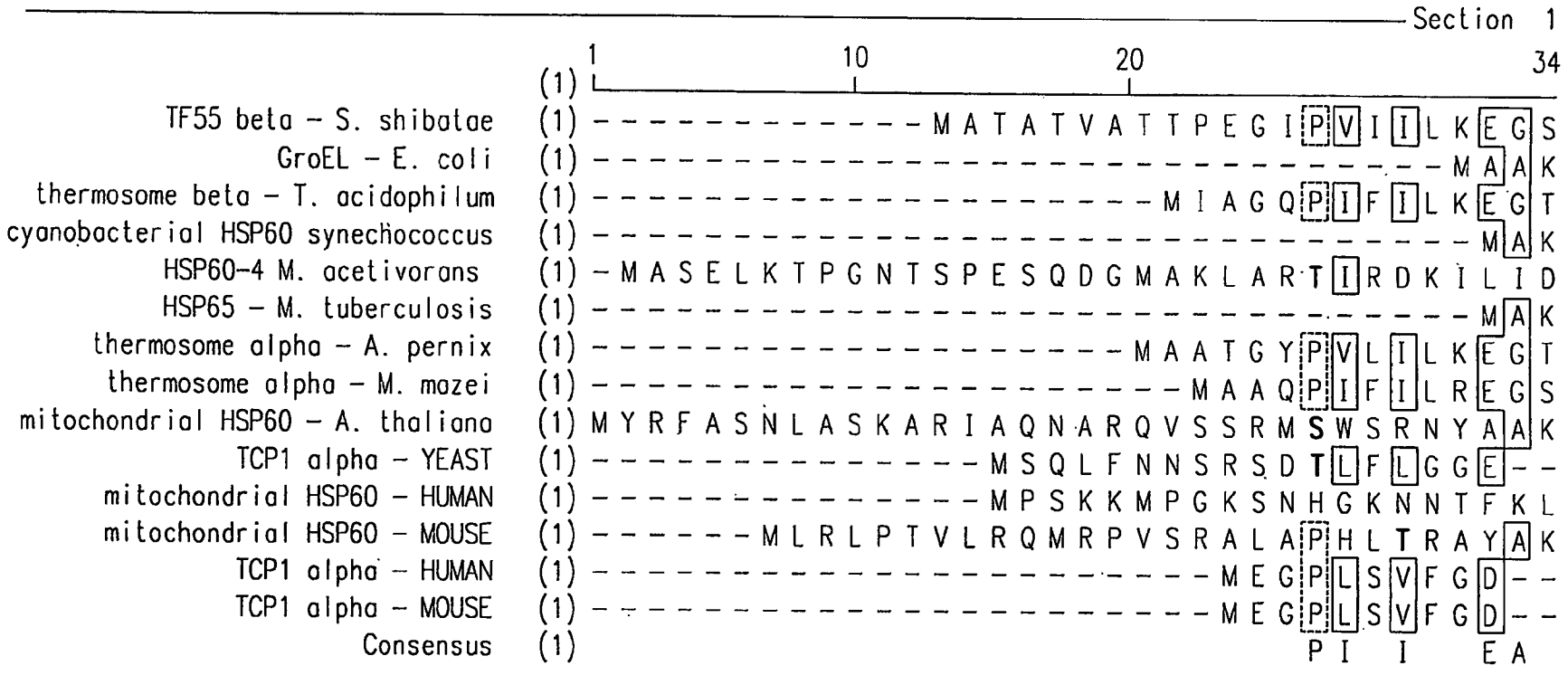
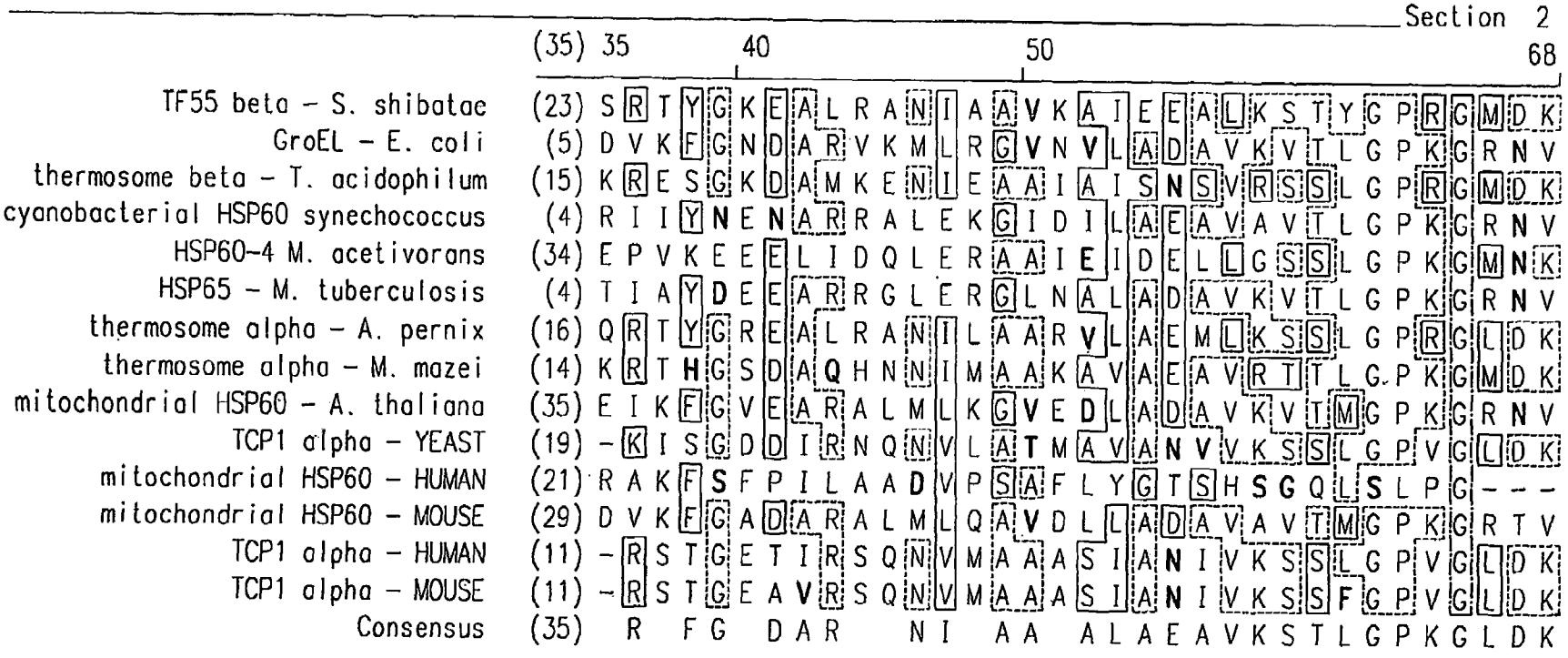

Section 1
1
10
20
34
TF55 beta – S. shibatae
GroEL – E. coli
thermosome beta – T. acidophilum
cyanobacterial HSP60 synechococcus
HSP60-4 M. acetivorans
HSP65 – M. tuberculosis
thermosome alpha – A. pernix
thermosome alpha – M. mazei
mitochondrial HSP60 – A. thaliana
TCP1 alpha – YEAST
mitochondrial HSP60 – HUMAN
mitochondrial HSP60 – MOUSE
TCP1 alpha – HUMAN
TCP1 alpha – MOUSE
Consensus
LEGEND:
IDENTICAL RESIDUES EXA.
BLOCK OF SIMILAR EXA.
CONSERVATIVE EXA.
WEAKLY SIMILAR EXA.
NON-SIMILAR EXA.

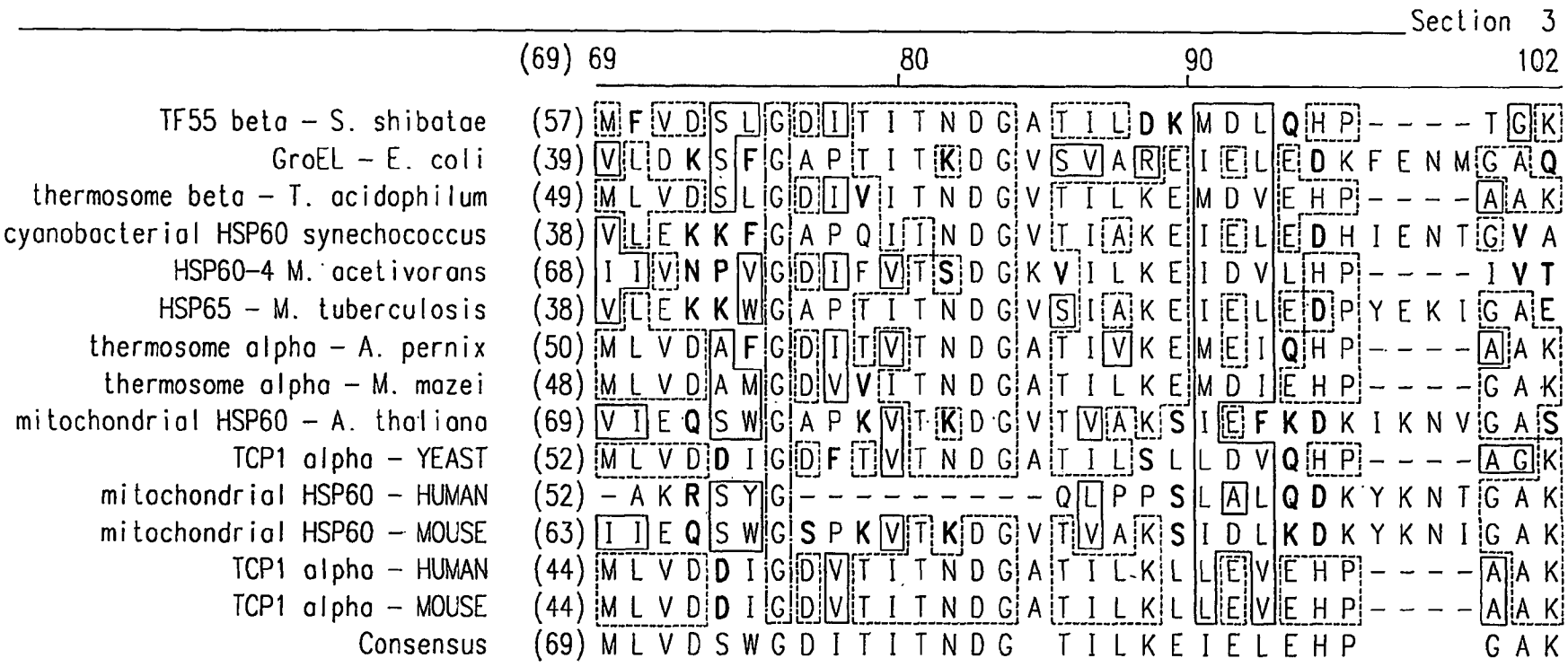
FIG.2A



LEGEND:

- G IDENTICAL RESIDUES EXA.
- G BLOCK OF SIMILAR EXA.
- G CONSERVATIVE. EXA.
- **G** WEAKLY SIMILAR EXA.
- G NON-SIMILAR EXA.

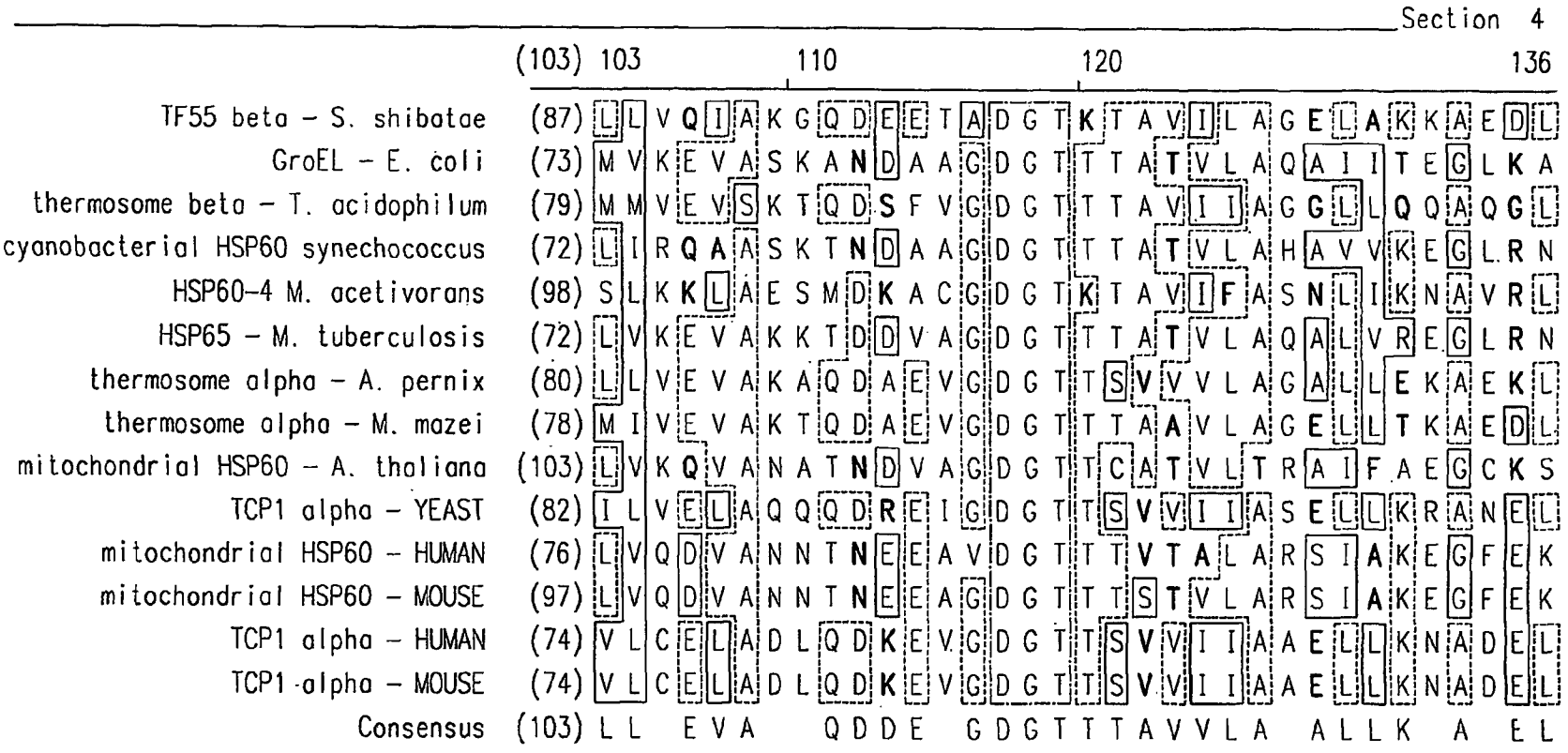
FIG.2B



LEGEND:

[G] IDENTICAL RESIDUES EXA.
[G] BLOCK OF SIMILAR EXA.
[G] CONSERVATIVE EXA.
G WEAKLY SIMILAR EXA.
G NON-SIMILAR EXA.

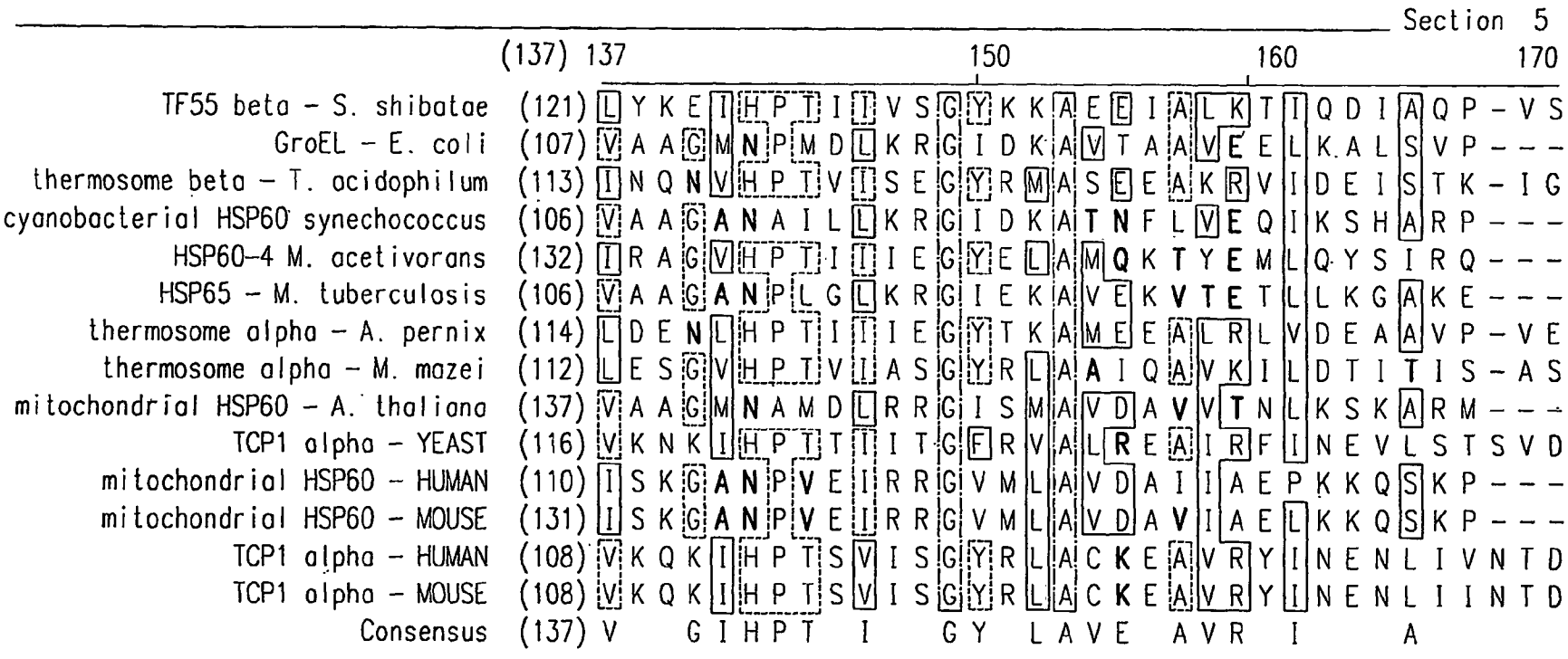
FIG.2C



LEGEND:

- [G] IDENTICAL RESIDUES EXA.
- [G] BLOCK OF SIMILAR EXA.
- [G] CONSERVATIVE EXA.
- **G** WEAKLY SIMILAR EXA.
- G NON-SIMILAR EXA.

FIG.2D

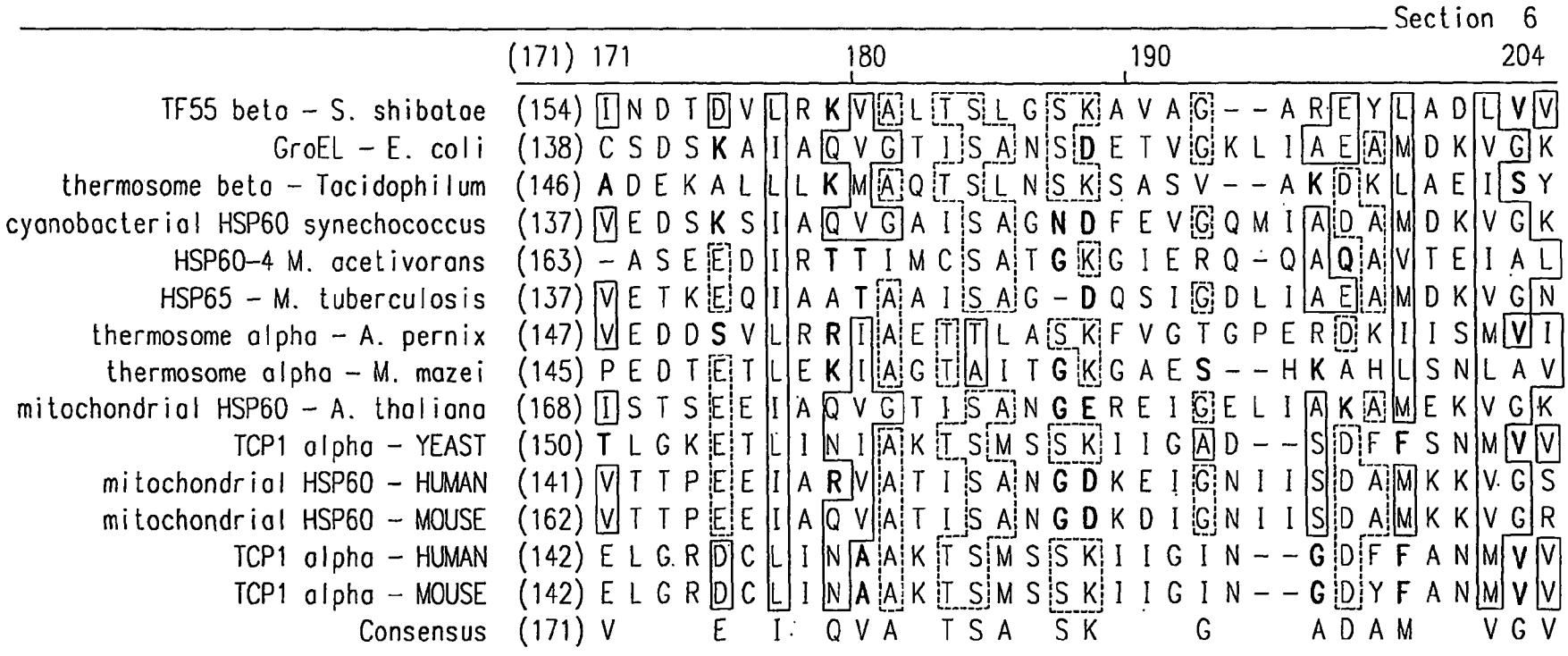


LEGEND:

- G IDENTICAL RESIDUES EXA.
- G BLOCK OF SIMILAR EXA.
- G CONSERVATIVE EXA.
- **G** WEAKLY SIMILAR EXA.
- G NON-SIMILAR EXA.

FIG.2E

Section 6



LEGEND:

- G IDENTICAL RESIDUES EXA.
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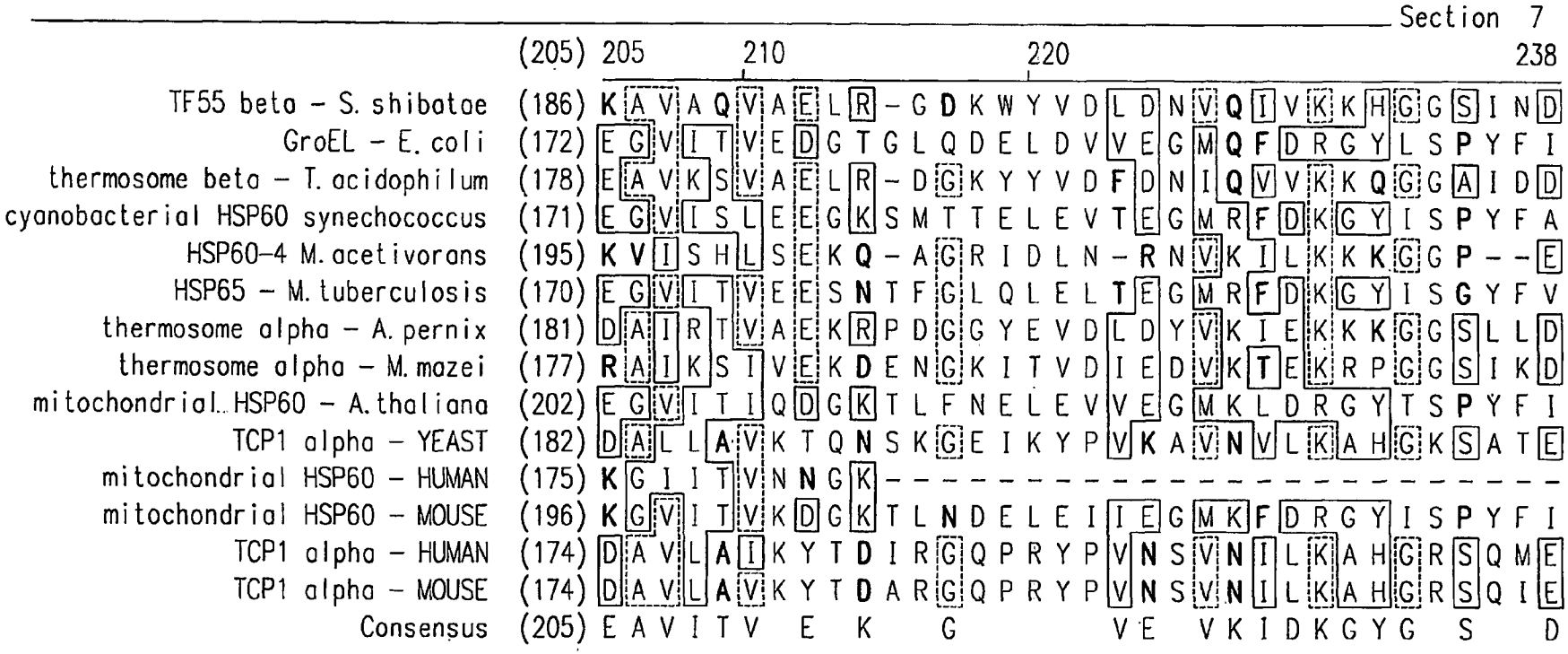
- G CONSERVATIVE EXA.
- **G** WEAKLY SIMILAR EXA.
- G NON-SIMILAR EXA.

FIG.2F

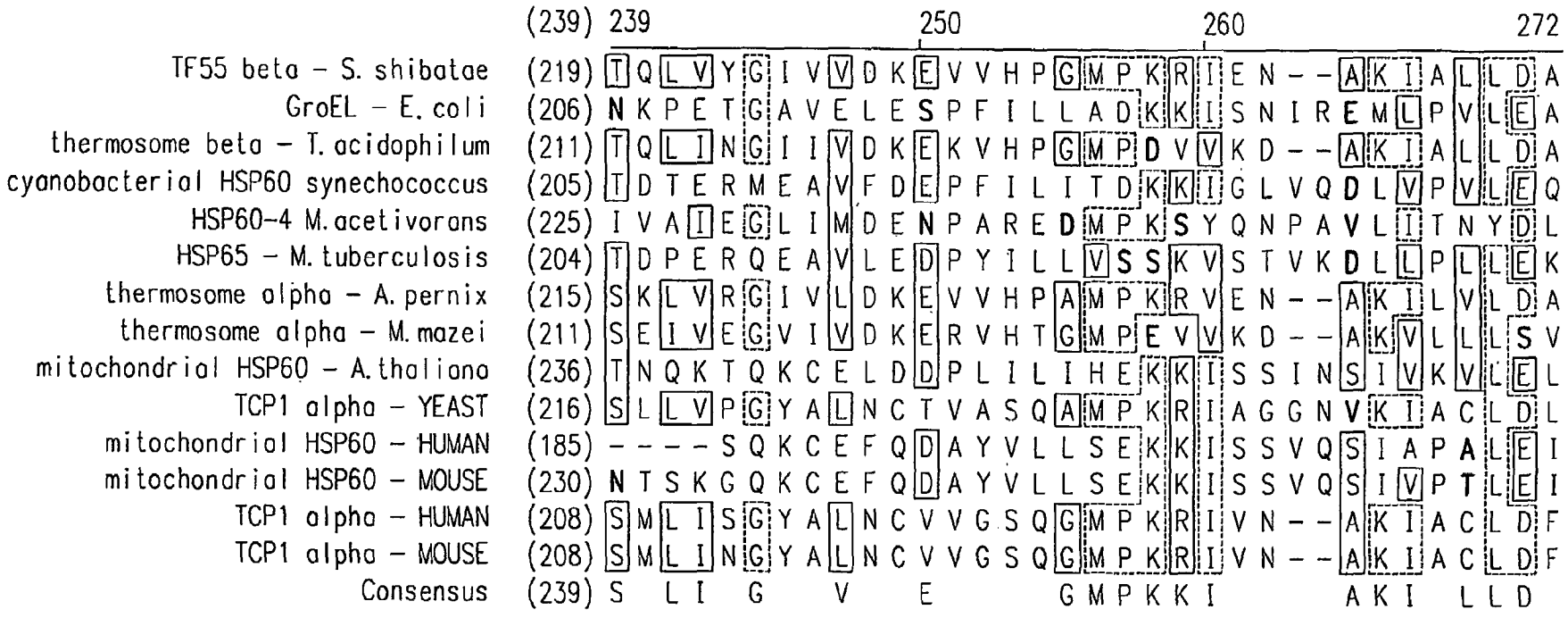


LEGEND:

- G IDENTICAL RESIDUES EXA.
- G BLOCK OF SIMILAR EXA.
- G CONSERVATIVE EXA.
- **G** WEAKLY SIMILAR EXA.
- G NON-SIMILAR EXA.

FIG.2G

Section 8



LEGEND:

- G IDENTICAL RESIDUES EXA.
- G BLOCK OF SIMILAR EXA.
- G CONSERVATIVE EXA.
- **G** WEAKLY SIMILAR EXA.
- G NON-SIMILAR EXA.

FIG.2H